3: Robequain--113-116 S-5 (no date) 1944 Laotians-1-5
116, 133, 503, 505, 177.50 France
636.50

"The Mekong appeared to offer a splendid means of penetrating the plateaus and mountains of Laos. At one time it was even suggested that Saigon could be one of the great ports for Southern China. As early as 1866, the Doudart de Lagrée and Francis Garnier mission realized the difficulties[114]of navigating the river above Kratié. This large river, as a matter of fact, is still very young as far as physical geography is concerned, or rather, a series of recent and still only partially explained tectonic episodes have renewed its youth. It consists of a chain of calm-surfaced reaches, separated by rapids or falls. The chief obstacle to navigation is at Khône where the arms of the river, spread out over an area several kilometers wide, drop 15 meters through torrential and rock-studded channles or cataracts. Here precisely is the border between Cambodia and Laos. Other rapids are scattered both up and down stream, making navigation by launch difficult and uncertain throughout entire sections between Kratié and Savannakhet. It is only at Savannakhet ('the gateway to paradise') that the great navigable reaches begin which permit launches to sail as far as several kilometers above Vientiane without breaking bulk.

Europeans were eager to tame the Mekong. As early as 1890 the Messageries

3: Robequain--113-116 S-5 (no date) 1944 Laotians-2
116, 133, 503, 505, 177.50 France
636.50

Fluviales de Cochinchine had organized a steamship line which, with the help of some trans-shipment, operated as far as Khône. For more than two years the launch, Argus, tried to get past the Khône barrier through the channels which canoes sometimes used in descending the river. In view of the failure of these attempts, a narrow guage railway was built across Khône Island, and by this means gunboats and then launches were carried to the upper river in 1893.

Conditions of navigation have been improved since then, but scouring the river channels has not always produced the desired results, since the river's reactions are difficult to predict; buoying had been improved up to 1925; more than a thousand towers, buoys and landmarks had been built. Hundred-ton launches, drawing one and one half meters, can reach as far as Khône, at high water, about three months a year; in other months, the section between Kratié and Khône, much of which had to be traversed by canoe up to 1900, can now be covered, with only one trans-shipment, by a short thirty-ton launch which can manage the sharp turns of the narrow channels. Above Khône, the most difficult passage is through the sandstone canyon of Kemmarat, where the river attains [115] a depth of eighteen meters during the heavy floods and the current in some rapids is from nine to ten knots. Since 1910 more powerful launches have been put into service, and were later supplied with semi-Diesel engines; they have gradually reduced the number of changes but the Keng Sa rapids are still impassable at low water

and necessitate trans-shipments to motor-canoes.

In 1895 a small gunboat, the Lagrandière, went up above the Savannakhet-Vientiane reaches to within 50 kilometers of the Yunnan frontier, about 2,500 kilometers from the sea and 400 meters above sea-level; this was a purely sporting exploit. Since then other steamboats have gone up as far as Luang Prabang, but it was realized that regular traffic could not be maintained through one section, dotted with dangerous rapids. Nevertheless, the trip between the two Laotian capitals previously made by native canoes plying upstream, and by rafts going downstream, has been very much speeded up since 1930 by the use of motor canoes.

In brief, progress is summed up in the following figures; in 1900, at low water, it took 65 days or more to go from Saigon to Luang Prabang; in 1909 the time was reduced to a maximum of 50 days; in 1937 the upstream trip took 37 days, downstream 27; and at high water, it took 27 or 22 days, respectively.

In spite of all this, French Upper Laos is still farther from Saigon by water than Saigon is from Marseille. Even below Vientiane in Lower Laos, the transport capacity of the Mekong depends on the obstacles encountered between Savannakhet and Khône. It is difficult to cut down the present length of the time needed for the journey: the narrowness of the channels and the limited power of the engines which can negotiate them do not

permit increasing the useful cargo beyond 100 tons. At low water, trans-shipment is a heavy burden on shipping. In 1936 only 4,644 tons of freight passed the port of Khone going downstream (10) and 5,286 tons upstream.

10. Excluding teak logs which are floated down the river.

Thus the high hopes for the Mekong as a means of transportation have been dashed. Experts believe that if additicnal improvements could increase the traffic to 25,000 tons a year, [116] this is a maximum which would be hard to surpass. Railways and highways will therefore have to furnish transportation which will be justified in the future by our reasonable expectations for an enlarged Laotian economy, if not by its extent at present. (11)

11. The arguments in favor of the water route are set forth by Colonel Bernard in the Bulletin du Comité de l'Indochine, February 20, 1936. Navigation on the Mekong has undergone great changes since the end of 1937, at the expiration of the contract of the Campagnie Saigonnaise de Navigation et de Transports, which had replaced the Messageries Fluviales. Steam launches no longer negotiate the Kemmarat narrows;

3: Robequain--113-116 S-5 (no date) 1944 Laotians-5
116, 133, 503, 505, 177.50 France
636.50

there is no longer a regular service between Paksé and Savannakhet. From Savannakhet to Vientiane service is now assured by a company employing flat-bottomed barges and from Vientiane to Luang Prabang and Xieng Sen by motor canoes."

10: d'Orleans--339 T-3 (1891-92) 1894 Laos
116, 133, 505

"This brings us to the confluent of the Nam Kane, which is not more than 130 feet broad, and is only accessible to canoes of light draught, whereas if there was more water, it could be utilized for the transport of goods as far as Luang Prabang. From Vinh to this latter place, the journey now takes about thirty days and the region situated between the coast of Annam and the Mekong is a very fertile one. This is the plateau of Poûon, which is in the possession of an European climate, the vine, fruit trees, melons and other European plants thriving well there. The country is a very healthy one, and there is a prosperous future before the intelligent colonists who know how to go to work."

23: Franck--324-325 T-2 (1924) 1926 Laotians
116, 501, 505

"More exactly they are floating furnished houses, a combination of raft and boats surmounted by three or four rooms and servant quarters, two small windows on each side of the superstructure, and all those refinements one expects among such a comfort-loving people as the French. At high water these house-rafts can go down the Mekong in fewer days than are required for the overland trip through the jungle, though by no means so fast as I proposed to make it; and at all times this way of leaving Luang Prabang is so usual [325] that rarely does a Frenchman in the colonial service go by land. In fact most of those bound for the capital come up the river also, though that is a hard and tedious job--for the native boatmen. An official salary continues unabated irrespective of speed. Upon due reflection, no doubt, an income forever dragging at the heels of my personal exertions has much more to do with my weakness for hurrying than have any impressions on the transmigration of souls. This trip down the river is not only comfortable, but interesting and sometimes exciting, if not dangerous. The piroguiers say prayers and throw food into the air, or place it, as well as flowers, on the bow of the boat before passing bad rapids, that the unseen spirits may be propitiated. But on board, all the amenities of French civilization prevail, from whist to the three-cornered drama, and romance has culminated and domestic disaster befallen during these long and too restful journeys."

69: Lewis T-5 (1950) 1951 AM1 Indochina
Laotians AM8

489 It was fitting that at Luang Prabang the impetus of travel should
509 have spent itself. Not even convoys ever came as far as this. Groups of unfortunate men occasionally set off on foot and walked for as long as three weeks through jungle trails to relieve isolated posts. Other arrivals and departures were by a weekly D.C.3 plying between Luang Prabang and Vientiane. It was booked up well ahead.

● 505 Down at the riverside the story was much the same as at Vientiane. There were pirogues which supposedly made regular journeys, but no one was prepared to commit himself to positive information about them. One authority went so far as to say that it was out of the question to hope to travel north by pirogue because the river was too low at this time of the year. I had just thanked him when the engine of what looked like a totally abandoned hulk, lying in an oily pool not far away, suddenly burst into wheezy activity. One of the crew of two said that they would be leaving in half an hour. Bound for where? – Vientiane? No . . . Xieng
701 Khong – for the unnavigable north, of course. All the space had been reserved for a body of ex-pirates who had changed sides and had now, it was said, demanded to be sent back to fight their former allies.

While I was slowly piecing together this jig-saw of information in pidgin-French, the brand-new patriots arrived for embarkation; a most apathetic looking body of men. In their ill-fitting uniforms they were standardized; deprived of individuality by a common factor of misery, an ingrained habit of expressionless stoicism. Silently they filed up the gang-plank and filled the dim interior of the pirogue. It was difficult to believe that the fire of conviction burned in any of these breasts, and I felt sorry for the French N.C.O. who was being sent back in charge.

000 But Monsieur Leveau said that there would also be a pirogue going south one day, and to save me from being victimized by Chinese cat-and-mouse tactics he sent for the owner and asked him when the boat would leave. With gentle satisfaction the Chinese

133 vast impenetrable forests and "the traveler sees only tall grass or
137 gigantic trees intertwined with lianas, then all at once, through a break in the foliage, he discovers the cascades of a river. This is the only noise to interrupt the impressive silence of these great forests" (2).

2. L. de Reinach, Le Laos, 1911.

133 Set against the huge mountain masses of Yunnan, this tormented region has always been the natural refuge of peoples driven out of India or China by famine, great invasions or religious discord, and its orography explains, in large measure, the multiplicity of tiny
/631/ states which were formed there throughout the ages. Its abrupt defiles radiate out and, so to speak, become calmed in the valleys of the Ménam, the Mékong and the Red River, and its principal substructure spreads out /5/ and ends in a vast plateau known as the plateau of Tran-Ninh, whose hillocks are planted with pine trees and drop suddenly from east to west.

In the southeast, however, the Tran-Ninh plateau clings "like an excrescence" to a long artery known as the Annamitic Chain which forms a distinct line of demarcation between Laos and Annam. This chain runs parallel to the coast in a northwest-southeast direction, and its peaks go all the way down to the Mékong by successive stages, first forming plateaus or folds of ground covered with thick forests (dông in Laotian), then slighter undulations where there are forest glades (khok in Laotian), and finally vast ricefields ending in the river.

The Mékong. This great river frontier which, over 800 kilometers of its length, marks the political separation of French Indo-China from the kingdom of Siam, gives life to Laos, together with its tributaries, "as the Nile constitutes Egypt." It fertilizes it with
/226/ its alluvia, feeds the native with its fish and guarantees transport for
/505/ his rafts and pirogues from north to south. But this liquid highway where nature seems to have taken pleasure in piling up obstacles and which is cut by numerous rapids and barred by waterfalls, can not be
/502/ /6/ regarded as usable for regular navigation over all of its length.
133 Fed by the melting snows of Tibet, the Mékong enters Laos through a capricious gorge, widens for a moment in the alluvia of an old lake basin and narrows again towards Luang-Prabang. Grandiose surroundings framed by the blue line of the far-off peaks give it what

phantom king (1) who had remained "under the guardianship of a 642
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1. Chao-Kham-Souk, one of Chao-Houy's sons (see above 647
p. 168 and p. 177, note 2) who had been placed on the /175*/
throne by Bangkok in 1863. His fief had been dismembered by the treaty of 1893 and was in reality no longer anything but a Siamese province. He was to die in 1899.

Siamese agent of an inferior type." At Khong he met Commander Tournier, who had been placed in charge of the Legion troops stationed between Stung-Treng and the islands of Khone, and who was also invested with civil powers in the muongs of the left bank while awaiting the imminent arrival of administrators from Cochinchina (this latter country was to organize the southern Laotian provinces at the expense of its own budget). On August 9 he wit- 654
nessed the arrival of Lieutenant-commander Simon, the leader of 505
a hydrographic mission /329/ which had been planned the year before by M. Delcasse. This mission was to employ the sloops La Grandiere and Massie and to go on surveillance duty on the Middle and Upper Mekong. With this purpose it was to: 1) trans-ship its cargo at Khone; 2) cross the dangerous defiles of Kemmarat by every possible means; and 3) stop "only where it was materially and absolutely impossible to get through." At the cost of tremendous effort the mission was to reach Luang-Prabang on September 1 and Tang-Ho on October 25, 1895 at a distance of 2500 kilometers from the sea and an altitude of more than four hundred meters (1). On

1. The bold results of the Simon mission demonstrated the possibility of organizing a regular navigation service from Saigon to Luang-Prabang by using either steam sloops or pirogues, depending on the season. The service was later established.

August 13 Pavie reached Pnom-Penh and then went to Hatien where 648*
the gunboat Vipere was waiting for him. The latter took him to 175*
Bangkok on the 20th, and scarcely had he landed when he hastened to inform both the Quai d'Orsay and Prince Devawongse of the discoveries he had made all along the Mekong, namely that the treaty had not been made known to the populace and that the king of Siam's proclamation relative to the return of former inhabitants of the left bank of the river to their own country was still unknown

149; Reinach--42 G-3 (no date) 1901 AM1 Indochina
Laotians AM8

c.--NAVIGABILITY OF THE MÉKONG
WHAT HAS BEEN ACCOMPLISHED--WHAT REMAINS TO BE ACCOMPLISHED

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From the point of view of navigation, the Mékong does not constitute one continuous artery from one end to the other of its course. Several serious obstacles, such as the Khône waterfalls and the rapids of [56] Kemmarat, lie in the way of steam navigation. It has therefore been found necessary to divide the river, as far as navigability goes, into several reaches. These are:

1. The reach of Luang-Prabang or upper reach, which extends [Illustration here] from the Mékong's entry into Laos to Sam-Pan-Na, that is to say from approximately the 22nd parallel to the 18th.

In this reach navigation is impossible, even for pirogues, as far as Tang-Hô because of the river's irregular drop in level (approximately 160 meters over a distance of 180 kilometers) and the many rocks which encumber its bed.

From Tang-Hô to Vien-Tiane navigation by pirogues and [57] [Illustration] [58] [Blank page] [59] rafts is the rule and native boats function all year long despite fairly numerous rapids.

2. The reach of Vien-Tiane or middle reach, which extends from Sam-Pan-Na to Ban-Ta-Sa-Kou (right bank) or Hueûn-Hin (left bank), that is to say from the 18th parallel to slightly below the 16th and the head of the Kemmarat rapids. This reach is navigable for steamships of a draft of one meter during almost all of the year.

Between this last reach and the following one comes the extremely precipitous part of the river which is known as the rapids of Kemmarat and stretches over a distance of 160 kilometers as far as Pak-Moun (15° 20'). In its present state steam navigation of any sort is impossible. All year long, however, rafts and pirogues can go downriver through the rapids, but only pirogues can go upriver.

3. The reach of Bassac, between Pak-Moun and North Khône, that is to say between approximately 15° 20' and 14°.

This reach is navigable all year long and over its entire length for rafts and pirogues, and only during three or four months (July to October) for steam launches.

To the south of this reach the Khône waterfalls form a complete obstacle to steam navigation over a distance of about five kilometers. Before the establishment of the railway transhipment of merchandise

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from upstream to downstream and vice versa was accomplished by means of oxcarts. In the high water period, however, loaded pirogues ventured to descend the passes. Nowadays the railways offers such advantageous transportation that merchants no longer have any reason to expose their pirogues to the dangers of the Khône passes or to effect a transshipment by means of carts or bearers.

4. The maritime reach from South Khône to the sea.

For a distance of about 200 kilometers, that is to say from South Khône to Kratié (Cambodia), this reach is navigable for steam launches only during the high water period (July to October). It is navigable over a shorter distance, from Khône to Stung-Treng, in all seasons. From Kratié down to the sea steam navigation is possible all year long.

[60] Thus, despite its great rate of flow and the volume of its waters, the Mékong can be negotiated by steam launches only over a small part of its immense course. Here navigation will be interrupted by insurmountable changes in level, there it will be stopped by the rapidity of the current, and elsewhere a lack of water or sand will form an obstacle. In short, the Mékong is a capricious river and has, in addition to a few magnificent reaches where steam navigation is generally easy, rapids which render it dangerous and even impossible.

Under present conditions the Cochinchina River Merchant Fleet [compagnie des Messageries fluviales de Cochinchine] has been able to establish a fairly direct service by steam launch and pirogue from Saigon to Luang-Prabang, over a total distance of 2300 kilometers.

The following table shows the length in kilometers of possible journeys both by steam launch and by pirogue during high and low water periods.

149: Reinach--44 G-8 (no date) 1901 AM1 Indochina
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KRATIÉ TO LUANG-PRABANG

Distance in kilometers: 1503.4

Stage	High Water		Low Water		Observations
	Steam launch	Pirogue	Steam launch	Pirogue	
Kratié to Stung-Treng	135	—	—	135	
Stung-Treng to South Khône	55	—	55	—	
South Khône to North Khône	5	—	5	—	Railway
North Khône to Ban-Dong	28.8	—	—	28.8	
Ban-Dong to Don-Saï	32.9	—	32.9	—	
Don-Saï to Pak-Moun	127.7	—	—	127.7	
Pak-Moun to Savannakhèt	—	210.5	—	210.5	
Savannakhèt to Kabao	30	—	—	30	
Kabao to Vien-Tiane	453	—	430	23*	*Stage from Don-Kassec to Don-Nakè
Vien-Tiane to Luang-Prabang	—	425.5	—	425.5	

We may recapitulate the above table without further commentary, for the figures speak for themselves.

[61]

			kilometers		kilometers
From Kratié to Luang-Prabang	High water:	steam launches	867.4	(57%)	1503.4
	"	pirogues	636	(43%)	
	Low water:	steam launches	522.9	(34%)	1503.4
	"	pirogues	980.5	(66%)	

No more need be said in order to show that the problem of commercial transport by steamship on the Mékong is far from being solved.

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A rapid glance at what has been done to make the river navigable will enable us to indicate the work that has been accomplished, the difficulties that have been overcome, and what still remains to be done.

The question of navigation on the Mékong was first raised by Francis Garnier in 1866 when he went up the great river as second in command of the exploratory mission to Indo-China. At this time, steam navigation on the river stopped at Kratié, about 220 kilometers upstream from Pnom-Penh. As a consequence Francis Garnier was immediately led to study the possibility of steam navigation beyond the Sambor rapids, the extreme limit of the hydrographic exploration which had then been done along the Mékong.

"Steam navigation," he said (1), "although strictly practical as far as the foot of the Khône waterfalls, presents a great many difficulties. Between Kratié and the island of Khône it is doubtful whether any channel exists which is deep enough at the low water period. In the high water period sufficient depth is no longer a question, but the velocity of the current reaches its maximum and is great enough to halt the progress of a steamship, or at least impede its movement."

(1) Francis Garnier, op. cit. [Voyage d'exploration en Indo-Chine, 1885.]

These considerations were true at the time when the author visited these parts, but are no longer entirely applicable as concerns navigability during the high water season. Indeed, steam navigation has gradually been transformed and mechanical equipment has been perfected, yet despite all this a period of twenty-two years passed [62] before any serious and effective attempt was made to achieve results for which Francis Garnier's conclusions could not have led us to hope.

In September 1885 Post-captain Réveillère succeeded in passing, in a torpedo boat, the Préa-Tapang rapids which form the principal obstacle on the Mékong, somewhat below [illustration here] the frontier of Cambodia and Laos. In 1886 and 1887 Lieutenant-Commander de Féligny, who was assigned to study the hydrography of the river above Kratié, made a serious study of these rapids and proved that it was possible to pass them in small ships. He first took the gunboat Sagaie to Stung-Treng, and then took the launch Mouette of the Cochinchina River Fleet [Messageries fluviales de

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Cochinchine] as far as the Khône waterfalls, as well as the launch Doc-Phu-ca of the local service.

It remained for his colleague, M. Heurtel, to pass these [63] same rapids in boats of comparatively high tonnage and thus open the regions of southern Laos to trade once and for all. At the end of August in 1889 M. Heurtel passed the rapids for the first time in the side-wheeler sea sloop Alouette, which was no less than fifty meters in length, then a few days later in the packet Cantonnais of the River Merchant Fleet. The latter was forty meters long, made a speed of nine knots and drew 1.9 meters of water, and he took it well above Stung-Treng to the very foot of the Khône waterfalls.

It had been shown that a commercial service by steamship was possible during several months, at the high water season, as far as Khône. Now that the way lay open M. Rueff, the skilful director of the Cochinchinese River Merchant Fleet [Messageries fluviales de Cochinchine], hastened to extend a regular line of steam navigation along the great river beyond Kratié, first to Samboc, then to Sambor, and finally to Stung-Treng and Khône (1890).

Since 1891 the Bassac, which was specially built to order for the Cochinchinese River Merchant Fleet by the Dubigeon yards in Nantes so that it could pass rapids and shallows (it draws only .7 meter of water when loaded), has provided regular and rapid communication between Saigon, Pnom-Penh and Khône.

There remained the ticklish question of finding a channel through the Khône rapids. Francis Garnier was quite categorical on this point.

"At the cataracts themselves," he said, "continuous navigation of the Mekong must necessarily stop unless gigantic projects are undertaken." (1)

(1) Francis Garnier, op. cit. [Voyage d'exploration en Indo-Chine, 1885.]

People nevertheless believed that a practicable passage existed, for pirogues arrived in Pnom-Penh each year which came directly from Bassac. It was also learned, at the same time (this was in 1891), that Siamese sloops were navigating on the Moun and would perhaps soon even come down the great river as far as Bassac.

[64] "The work of the Siamese," wrote M. Delaporte, a former

503 member of the Lagrée mission, in 1891 (1), "have resulted in a plan

[113] (1) L. Delaporte, La grande voie commerciale de l'Indo-Chine, 1891.

505 to establish a complete service serving the course of the Mékong, in order to divert its trade to the heart of the kingdom of Siam via the fine Sé-Moun river and then take it by railway to the capital and the sea. This plan is now in the process of full achievement. Two steamships will very shortly be introduced, one on the middle course of the river between Bassac and Kemmarat with its headquarters at Pak-Moun at the river junction, and the other on the Sé-Moun between Pak-Moun and Khorat at the point where the river ceases to be navigabl and this service will be completed by a railway joining Khorat to Bangkok."

505 It was thus a question of out-distancing the Siamese sloops. Governor General Piquet himself became interested in the matter
503 and embarked on board the Cantonnais (October 1891) in the hope of passing the Khône rapids and showing the French flag in the upper
654 reach. The Argus, under the command of Ensign Guissez and serving as a look-out ship for the Cantonnais, reached Khône and tried to reconnoiter the passage. The latter had been shown by the inhabitants to M. Pelletier and Dr. Mougeot, two Europeans who then held the concession to the large island of Ca-Lomnieu, and was accessible at certain times of the year to pirogues coming down the river. But the season was far advanced (it was the end of October). The low water made it impossible to attempt the desired trial, and the Cantonnais had to return to Saigon.

In the meantime the Argus anchored in the pass of Ka-Sedam between the rapids of Tat-Vai and Tat-Lion in order to complete the studies which had been begun and the exploration of the river as far upstream as possible. For more than two years this launch tried to negotiate the passes, but failed because of its large draft, its instability and its lack of speed.

The persevering energy and efforts of its commander were not lost, however, for they prepared the way for the work subsequently undertaken in these parts.

It being impossible to find a suitable passage for [65] [Illustration] [66] [Blank page] [67] steamships, a transshipment railway was built

149: Reinach--48 G-3 (no date) 1901 AM1 Indochina
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across the island of Khône. It was further necessary to establish two docks, one a tidal dock and the other a launching basin, at South Khône and at North Khône, especially for the transshipment of launch cargoes.

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Lieutenant Commander Simon expressed himself as follows in a lecture which he delivered to the Geography Society [Société de Géographie] on May 15, 1896:

"Believing themselves protected, thanks to this natural barrier, from any repressive measures on our part, the Siamese had crossed the Mékong at Kemmarat, Lakhône and Outhène and were invading Annam little by little and establishing advance posts as little as three days away from Hué. This took place in 1892.

"The government became alarmed, and in order to satisfy solicitations by Cochinchina at the same time, it decided at the suggestion of M. Delcassé in March 1893 to purchase two screw-propelled gunboats, the La Grandière and the Massie, which were intended to exercise surveillance over the upper Mékong.

"These two ships were to be set afloat above the Khône waterfalls. From there they were to negotiate, by any possible means, the Kemmarat gorge which is particularly dangerous for its rapids, and then show their flag at daybreak in the great reach, presumably navigable, which extends from Kemmarat to Vien-Tiane and whose eastern bank includes Annamite Laos.

"Such was the object of the mission which was entrusted to us.

"It was at the same time a hydrographic mission whose work was to take the Khône waterfalls, which steam navigation has today brought within four days' journey of Saigon, as its point of departure and stop only when it was materially impossible to proceed any further.

"As far upriver as possible and as far as possible, these were the orders of the day.

"The ships, which were demountable in five sections, were assembled and set afloat at Saigon in August 1893, and their transshipment past the waterfalls was accomplished in one piece, that is to say without disassembling them, on a carriage which was built for the purpose and which rolled along a track. The track, which was one meter wide, started at the downstream end of the falls, that is to say in the lower basin, and ended in the upper basin after crossing the island of Khône.

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"The administration of public works of Cochinchina was particularly responsible for carrying out the work. The operation was directed by Messrs. Gubiand, the engineering director of public works, and Crouzat, the chief clerk of the department of civil engineering [conducteur principal des ponts et chaussées], and was fully successful despite the haste, the difficulties and the mishaps and tribulations which we had to undergo.

"On October 31, 1893, five months after the mission's arrival in Saigon, two ships, the Massie and the Ham-Luong, had passed the Khône waterfalls.

"The Ham-Luong was a sloop from Cochinchina which was sent at the last [68] moment and in all haste to replace the La Grandière numerically and provisorily, the latter being disabled below the falls as the result of grave damage to the engine."

After they had been floated in the upper reach the Massie and the Ham-Luong pushed on to Bassoc immediately, then to the junction with the Sé-Moun. The Massie finally reached Kemmarat on February 28, 1894, after successfully passing the 120 kilometers of rapids just below it. There the Massie had to wait for high water before it could pass the Keng-Sa, one of the most dangerous obstacles in this region. In the high water season of 1894 it was in the Vien-Tiane reach, where it showed the French flag over an extent of more than 500 kilometers. On September 5, 1894, the La Grandière went to Khône in its turn, on its way from one reach to another, and then in November caught up with the Massie which it soon passed. Finally in August 1895 Lieutenant Commander Simon took the La Grandière through the series of rapids stretching over a distance of 350 kilometers between Vien-Tiane and Luang-Prabang, which he reached on September 1.

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"This brilliant success demonstrated France's power to the friendly and hostile populations of the banks of the Mékong. Through the more frequent sight of our officers, our weapons and our cruising steamships, which ammounted to ambulatory offices, it strengthened the work accomplished by our diplomats on the left bank, which belonged to us henceforth" (1).

[13]

(1) Lanier, L'Asie, 1898. Selected readings in geography.

We rejoice at being able to render deserved homage here to the abilities of Commander Simon who, in the midst of the greatest

difficulties, was able to complete the daring work which he had assumed. He did not fear to turn his own hand to the task by giving largely of himself and often remaining in a pirogue in the middle of the river, despite the heat of the sun, in order to seek out a passage for his gunboat.

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But Luang-Prabang was not to be the terminus of the La Grandière's journey.

[89] "The difficulties which had long been pending in western upper Laos had just entered into a more acute phase. It was more than ever timely and urgent for us to strengthen our diplomatic arguments with the help of effective justifications of our rights based on accomplished facts.

"We had to show our colors still farther upstream, at least as high as Xieng-Khong, that is to say, in the heart of the territories which others had attempted to detach from our influence by proposing that they remain neutral" (1).

(1) Lieutenant Commander Simon, op. cit. [Lecture delivered to the Société de Géographie on May 15, 1896.]

On September 8, the La Grandière resumed its march upriver.

"Finally we reached our last stage, Tang-Hô, on October 25, 1895. We were a day's journey from Xieng-Lap, at 20° 40' N. latitude, 2500 kilometers from the sea and at an altitude of more than 400 meters. Here the La Grandière was stopped once and for all, for in the present state of things Tang-Hô must be regarded as the limit of all possible ventures in steam navigation, at least when the water level is low" (2).

(2) Lieutenant Commander Simon, op. cit.

These conclusions did not give pause to Lieutenant Commander Mazeran, for he took his gunboat further still. It is now at Xieng-Lap, immobilized and unable to return downriver. There is some question of disarming it and attempting to bring it down to Luang-Prabang by surrounding it with a bamboo sheath. It could at least be used and render some service in Luang-Prabang.

The results of Lieutenant Commander Simon's mission relative to the navigability of the reaches of Bassac and Vien-Tiane enabled the Cochinchina River Merchant Fleet Company [compagnie des

505 Messageries fluviales de Cochinchine] to introduce a regular service
503 of steam launches there. To this end the company signed a contract
654 with the general government of Indo-China, the purpose of which was to organize a complete service from Saigon to Luang-Prabang for passengers and merchandise, using steamships and pirogues by turns, depending on the navigability of the river and on the season. The task was a difficult one, for it was first necessary to enlarge the [70] tidal docks and launching basins and to rebuild, strengthen and correct the railway on the island of Khône to permit the transshipment of three steam launches weighing seventy tons each (1). This [Illustration

(1) The gunboats Massie and La Grandière weighed only twenty-two tons each.

here] was a veritable tour de force which had to be repeated three times. During the high water period of 1893 (2) the operation was

(2) For this transshipment, as for that of 1894, human labor was the driving force. Only since August 1898 has a locomotive run along this railway.

carried out with complete success, [71] [Illustration] [72] [Blank page] [73] thanks to the combined work and efforts of the local administration and the River Merchant Fleet Company [compagnie des Messageries fluviales]. Today one of these ships, the Garcerie, is assigned to regular service in the Bassac reach between Khône and Pak-Moun. The two others, the Trentinian and the Colombert, have followed the path laid out for them by the gunboats through the Kemmarat rapids and provide service in the Vien-Tiane reach over a distance of nearly 500 kilometers (1).

(1) Just recently the launch Hamluong, which is 22 meters long, has a draft of 1.3 meters and a speed of seven to eight knots, has gone upriver through the Kemmarat rapids under the command of the engineer Jeanneau and has reached Vien-Tiane where it is at the disposition of the Superior Resident.

503 Here, then, is an initial result achieved. During the high water
505 period steamships can provide service from Kratié to Khône. Others

have been introduced in the upper reaches and can easily serve, 503
during the high water period, nearly 200 kilometers in the Bassac
reach and nearly 500 in the Vien-Tiane reach. But during the low 505
water period the stretch between Kratié and Khône is still served by
pirogue over the greater part of the course. Then the navigable reach
of Bassac is reduced to thirty kilometers for steam launches, and
the Vien-Tiane reach requires transshipment by pirogue over some
twenty kilometers between two stretches covered in the above manner.
The two reaches are, moreover, separated by a 160-kilometer strip
which is not navigable in any season.

The impetus has therefore been given, and the way lies open.
Today it remains only to complete the work thus begun and to finish
setting the necessary beacons and clearing the bed of rocks before
navigation, and that is to say trade, can be expanded further. Let
us recapitulate what has been done and what has been proposed.

First of all, from the budgetary point of view, a sum of 87,500 503
francs has so far figured annually in the budget of Laos under the 652
label Studies and projects for the navigability of the Mékong. This
sum was further increased in 1900, and in the budget for public works
in the general interest the following credits appeared:

	francs
Navigability of the Upper Mekong. Purchase of materials for clearing rocks and laying beacons	25,000
[74] Clearing rocks and laying beacons in the lower reach	12,500
Clearing rocks and laying beacons in the middle and upper reaches	62,500
Continuation of studies	25,000
TOTAL	125,000(1)

(1) In 1901 the following figures appeared in the general budget:

Clearing rocks and setting beacons in the Upper Mekong in the lower and middle reaches	75,000
In the upper reach	25,000
Studies	25,000
TOTAL	125,000

It may therefore be assumed that several thousands of francs
have already been spent to make the great river navigable. It must
be admitted that so far the visible results have not compensated for
the sacrifices made, and we prefer to suppose that such credits are

503 predict. It has therefore been decided that, for the moment at least, no more attention should be given to these rapids and that our concern should be restricted to accomplishing the labors necessary to facilitate steam navigation during the low water period in the following reaches:

"1. from Kratié to Stung-Treng and Khône;

"2. between Khône and Pak-Moun;

"3. between Savannakhèt and Sam-Pan-Na."

It might perhaps be understandable that the plan to make these rapids navigable should have been abandoned, if haste were made to build a railway joining the middle Mékong to some port in Annam, when the rapids would become an absolute barrier which we should [138] no longer think of overcoming. But such is not the case, and many long years will still have to pass before the products of the markets of Luang-Prabang and Nong-Khay can reach the Annam coast in any practical way. Moreover, if the work on the navigability of the Mékong continues to go forward at the same slow rate and if we do not take greater advantage of this "moving highway," we shall continue to play into the hands of the Siamese and the market in Bangkok, thanks to the Korat railway, will continue to absorb the Laotian products which should have no other outlets than Saigon, Tourane and Vinh.

d.--DESCRIPTION OF THE DIFFERENT REACHES

1. The Upper Reach

133 505 The Mékong enters Laos where it is joined by the Nam-La, at 21° 40' N. latitude, slightly downstream from Xieng-Hong which is on the 22nd parallel. As far as Xieng-Sèn it flows in an approximately northeast and southwest direction between two ranges of peaks which constrict its bed and make it a torrent rather than a river. In this narrow corridor it has dug a channel which varies, during the high water period, from 150 to 800 meters in width and which sometimes grows as narrow as 50 meters during the low water period. Its bed is generally encumbered with shoals and [79] rocks, and the whirlpools, eddies, currents and counter-currents make navigation impossible. Thus Lieutenant Commander Mazeran's bold and successful venture deserves mention here, for he succeeded in taking the gunboat La Grandière as far as Xieng-Kok, that is to say nearly to the 21st

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parallel, and 2800 kilometers from the sea.

It was a noteworthy physical effort, but unfortunately a useless one which in no way proves that the Mekong is or ever will be commercially navigable in this region.

Tang-Hô is the point where all ships must stop, no matter what they may be, and not even a Laotian pirogue boatman would venture into the rapids which lie upstream. It may be of interest to quote, in this connection, the opinion of M. Garanger, who was for a long time government commissioner in Vien-Poukha.

"The outlet on the Mékong for the whole region," he says, "is at Tang-Hô at the foot of the famous rapids which are regarded as the terminal point of navigation, since further upstream there are nothing but small pirogues designed for fishing.

"The question of passing the rapids was of too great an interest to the northern part of my commissionership for me not to take some account of the hopes which had been aroused by the successful passage of the La Grandière.

"I was forced to conclude, after following the gunboat's itinerary, that the difficulties remained almost insurmountable. The route followed by the La Grandière is now on dry land in the midst of sand and rocks of a chaotic appearance and some 250 or 300 meters from the rapids. There is water over the bank where passage was found for only two or three months of the year, and it attains an appreciable depth only during the few days which mark the maximum of each rising. The rapids themselves, where all the water is now concentrated, roll on with unheard-of violence in a narrow corridor bordered by two rock walls, and the last attempt to negotiate the passage in a pirogue resulted in the death of one man and the loss of the boat.

"Further upstream, according to the natives, there are still graver obstacles, but they never had any occasion to see them. This information should be accepted only with great reservations, but I myself saw in Xieng-Hong, in 1893, that by using the sandbanks natives were able to cross the great river without ever going further than knee-deep into the water."

Upstream from Xieng-Sèn the Mékong is joined on its right bank by the Nam-Huok, which serves as the frontier between the Anglo-Burmese States and [80] Siam. Slightly downstream from this point it is joined by the Nam-Khôk. From the latter point the river describes a northward curve as far as Xieng-Khong. It then resumes

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its southward course, and just before it reaches the 20th parallel it is joined by its first important left-bank tributary, the Nam-Tha.

The Nam-Tha comes from the northeast and crosses the rich plain of Muong-Luong-Nam-Tha which has been called "the jewel of all Upper Laos," for it is an extremely fertile and well watered region capable of being made into an infinite number of fine rice-fields. The Nam-Tha is navigable in all seasons as far as Sop-Ngim, and as far as Muong-Luong for small pirogues.

The Mékong continues in a sourtherly direction as far as Ban Pak-Kop (19° 45'), then suddenly bends eastward for a distance of 200 or so kilometers as far as Luang-Prabang, as if it were going to flow into the Gulf of Tonkin. In this part of its course it flows between steep hills. It can be navigated by pirogues in all seasons despite the Keng-Li rapids, which require merchandise to be unloaded during the low water period. Upstream from Luang-Prabang it resumes its north and south direction, and towards the 20th parallel its left bank is joined by three large rivers, the Nam-Hou, the Nam-Suong and the Nam-Khan.

In view of the length of its courses and the volume of its waters, the Nam-Hou may be regarded, as we have noted, as one of the branches of the Mékong. Although its mouth is narrow, it soon widens out and takes on the appearance of a great river as far as Muong-Ngoi. At this point it becomes narrow again, only to widen once more until its junction with the Nam-Ngoua. The Nam-Hou could doubtless be negotiated by steam launches during the high water period as far as Muong-Koua (about 150 kilometers from Luang-Prabang), the market where the produce of the region is concentrated. It is navigable in all seasons for pirogues as far as Muong-Houa. From Muong-Houa to Muong-Hahin and Muong-Hou the Nam-Hou can be negotiated only by extremely narrow rafts going downstream. The great rapids of Keng-Louang, situated a day's journey from Pak-Hou, require the cargoes of pirogues to be completely unloaded during middle and low water periods.

[81] By way of the Nam-Ngoua, its left-bank tributary, and its sub-tributary the Nam-Youn, which are navigable in all seasons for small pirogues, the high plateau of Muong-Theng (Dien-Bien-Phu, province of Van-Bu, Tonkin) can be reached. From that point two land routes connect with the Black River at Muong-Lai (Lai-Chau) and Van-Bu.

[48]

487 A particularity which should be noted is that these two land routes which represent some hundred odd kilometers are the only ones which the traveler can take in order to go from Hanoi to Saigon by way of Luang- [Illustration here] Prabang, that is to say by way of the Red River, the Black River, the tributaries of the Mékong and the great river itself, or in order to cover a total distance of approximately 3200 kilometers. These hundred kilometers of land roads are the only ones which merit the name, since all the rest of the journey is made on navigable waterways in steamships, pirogues and rafts.

505 133 The Nam-Suong and its tributary the Nam-Seng can be negotiated in all seasons by pirogues and rafts. Ban-Pak-Seng, at the junction of the Nam-Suong and the Nam-Seng, is the capital of one of the most prosperous cantons in the province of Luang-Prabang.

A day's journey away from Luang-Prabang the Nam-Suong is blocked by [82] a shelf called the Keng-Luang which necessitates complete portage of merchandise and even of pirogues and rafts at certain seasons.

The Nam-Khan is navigable for pirogues and rafts during the greater part of the year, starting at Muong-You which is the ford for the road from Tran-Ninh to Luang-Prabang. It flows into the Mékong in the northern part of this city, one of the suburbs of which it circles.

[361] Luang-Prabang, the capital of the kingdom of the same name, is situated at an altitude of 350 meters above sea level, at 19° 54' 20" N. latitude and 99° 45' E. longitude. From the commercial point of view it is one of the most important centers--if not the most important--in Laos. The city numbers about 10,000 inhabitants and 2000 houses. In Luang-Prabang the river is 350 to 400 meters wide. Just above and below the city it is blocked by sandbanks which leave a channel only 100 meters wide during the low water period, but which is always navigable for pirogues and rafts.

The following table shows the average length of time it takes to travel both up and down the rivers between Luang-Prabang and the posts on this reach.

JOURNEY		High water season		Low water season	
		Number of days Up	Number of days Down	Number of days Up	Number of days Down
Mékong	Luang-Prabang to Xieng-Khong	12	7	12	7
	Xieng-Khong to Tang-Hô	4	2	4	2
	Luang-Prabang to Pak-Lay	4	8	6	13
Nam-Hou, Nam-Ngoua	Luang-Prabang to Dien-Bien-Phu	15	8.5	15	8.5
Nam-Suong	Luang-Prabang to Sop-Sat (Muong-Son road)	8	6	8	6

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About fifteen kilometers from Luang-Prabang a series of rapids begins which makes navigation as far as Pak-Lay extremely difficult, even in pirogues. The Keng-Kaniok and the Keng-Louang [83] make it necessary to unload merchandise and transport it by land using bearers, while the pirogues pass the rapids empty. 505 133

Between Luang-Prabang and Pak-Lay the river is quite deeply cut into hills and rock masses, the sides of which constrict its bed to a width of only fifty meters at several points during the low water period. But as it approaches Pak-Lay (1) it widens out to 700

(1) Pak-Lay is situated at 18° 12' 20" N. latitude and 99° 5' E. longitude. [361]

or 800 meters.

In this part of the river we should note three tributaries of some importance on its right bank. These are the Nam-Houng, the Nam-Poun and the Nam-Lay, and in their valleys there are many teak trees.

Towards the 18th parallel between Pak-Lay and Xieng-Khan (2)

(2) It is at Ban Houé-Hat, between Pak-Lay and Xieng-Khan, that the Mékong comes closest to Bangkok (470 kilometers as the crow flies).

the Mékong is constricted between rocky headlands. Here it is extremely sinuous, and describes an overall northward bend slightly below the parallel (3). Then in another bend which is broader

(3) There is no tributary worthy of note on the left bank. On the right bank, however, about in the center of the bend and upstream from Xieng-Khan there are the mouths of two water-courses, the Nam-Huong and the Nam-Leui, which water a region of fairly dense population. One particularity to be noted is as follows: the sources of these two rivers are only a few kilometers away and are separated, by rather low ridges, 1) from the Nam-Lom-Sak, the easternmost branch of the Ménam, and 2) from the Klong-Koé-Noï, one of its middle left-bank tributaries.

and less winding, but which turns in the opposite direction, that is

133 to say towards the north, the river is joined on its left bank by the Nam-Sang and the Nam-Thon, the valleys of which are rich in gold
505 and catechu (sisièt). Then it finally leaves its steep gorges and reaches Sam-Pan-Na, the entrance to the great middle reach which extends as far as Savannakhèt.

Although it presents numerous navigation difficulties because of its rapids, native boats are nevertheless very active as far as Luang-Prabang by reason of the large flow of trade from this great market towards Bangkok by way of Pak-Lay on the one hand, and by way of Nong-Khay on the other.

[84] 2. The Middle Reach

133 At Sam-Pan-Na the Mékong leaves the region bristling with mountains which have restricted its course for good and all, and
505 spreads out at its ease in a fine navigable reach nearly 600 kilometers long.

361 It first passes through Vien-Tiane, the old capital of the kingdom of the same name which included, before 1827, all the Laotian territory on both banks of the Mékong between Luang-Prabang and Cambodia. Today the former state of things has been reestablished, and Vien-Tiane is once again the capital of French Laos. In fact, this point is the navigation terminus of the steam launches of the Cochinchina River Merchant Fleet Company [compagnie des Messageries fluviales de Cochinchine], even though the river is accessible to steamships as far as Kok-Peung, which is about 35 kilometers from Vien-Tiane, that is to say above Sam-Pan-Na. It would be true to add that the company would derive no commercial advantage from sending its launches that far up.

Between Vien-Tiane and Nong-Khay the river describes a sharp southward bend which doubles the 22-kilometer distance between the two points by land.

"Nong-Khay, which was founded after the destruction of Vien-Tiane by the Siamese, has partly inherited the importance of this old city. It is the greatest population center to be found on the banks of the Mékong between Pnom-Penh and Luang-Prabang" (1).

(1) Francis Garnier, op. cit. [Voyage d'exploration en Indo-Chine, 1885.]

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Today Nong-Khay numbers about 10,000 inhabitants and 2000 505
houses. It is the starting point for the ox-cart caravans which travel [492]
to Bangkok by way of Korat carrying all the products of northern Laos.

From Nong-Khay on the Mékong winds through a plain in a 505
northeast direction. Its banks are densely populated and highly 133
fertile. At Pon-Pissay, on the 18th parallel (2), the river makes

(2) The reader will have noted that the 18th parallel has often been referred to in the foregoing. This stems from the curious fact that, in its meanderings, the great river is theoretically cut seven times by the parallel between Pak-Lay and Saniabouri, that is to say over a distance of 535 kilometers.

another northward bend [85] as far as Keng-Sa-Doc, which is just downstream from Pak-Sane (Patchoum). From this point on the Mékong takes the course which it will keep all the way to the sea, following a line approximately parallel to the Annamitic Chain and to the Gulf of Tonkin.

Somewhat beyond Pon-Pissay the Mékong is joined on its left bank by an important tributary, the Ngûm, a fine river with a peaceful course whose valley is highly populated and gives rise to quite extensive trade. Cinnamon, tobacco and catechu [sisièt] are its chief products. The Ngûm can be navigated by pirogues and rafts in all seasons as far as Tinh-Kéo, where the river is joined by the Nam-Song, about thirty kilometers from Tourakhom. The gunboat Massie went partway up the river during the high water period. It is said that the Cochinchina River Merchant Fleet Company [compagnie des Messageries fluviales de Cochinchine] intends to begin a steam launch service along the river because of its commercial importance.

After the Ngûm on the left bank of the river come first the Nam-Mang, which is of no great interest, and then the Nam-Nhiêp, which might be thought larger than it really is, to judge by its mouth. In fact, its total length is scarcely fifty kilometers, and its valley is sparsely populated. Just downstream from the Nam-Nhiêp is the mouth of the Nam-Sane, which flows into the river at Muong-Pak-Sane (Patchoum). This river, which has a very winding course, can be navigated by pirogues and rafts in all seasons as far as Keng-Louang, to the north of Borikan. It can be navigated by steam launches over a distance of about fifty kilometers during the high water period.

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or as far as Muong-Borikan which is about halfway between the Mékong and the Keng-Louang. At Pak-Sane a road comes from the right bank and leads to Tran-Ninh by way of Borikan.

Downstream from Pak-Sane there is a series of small rapids which can be negotiated in all seasons. One of these is the Keng-Sa-Doc. Below this point the Mékong is joined by an important left-bank tributary, the Nam-Ka-Dinh or Nam-Teûn. Captain Gosselin describes the latter as follows (1):

(1) Captain Gosselin, op. cit. [Le Laos et le Protectorat français, 1900.]

[86] "The Nam-Ka-Dinh, or Nam-Teûn, has its origin in the center of the muong of Cam-Mon, on a very high and irregular plateau containing the watershed between the basins of the Mékong and of the China Sea. This torrential river, which cuts the plateau of Na-Kaï and receives all its waters, is unusual in that it has navigable tributaries while it itself is not accessible to navigation over the greater part of its course.

"This peculiarity can easily be understood from a glance at the map, where one may note the enormous difference in altitude which its course shows over a distance less than sixty kilometers, immediately downstream from the point where its tributary joins it."

It is possible to travel up the Nam-Ka-Dinh for a two days' journey, as far as the rapids of Keng-Bi.

Throughout this whole reach, as far as Ban Ta-Sa-Kou (right bank) and Hueûn-Hin (left bank), the Mékong retains the appearance of a peaceful river flowing between low banks which are now sandy, and now covered with abundant vegetation. Its width varies between 1200 and 1500 meters, and its waters are deep enough to make steam navigation possible almost all year long. However, the first rapids or Keng-Kassek, which are situated just above Saniabouri, are an obligatory transshipment point during the dry season, although this obstacle does not exist in the period of high waters. After Saniabouri the river passes between Outhène, a quite important market on the right bank, and Pak-Hin-Boun, the capital of a province on the left bank (Cammon).

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The Nam-Hin-Boun, a left-bank tributary, comes from the plateau of Na-Kaï. This river is unusual in that it flows into a tunnel

under the rocks, where it loses itself in an immense grotto. It can be navigated by pirogues in all seasons from Keng-Kièt on. 505 133

The large island of Don-Don is found between Pak-Hin-Boun and Lakhône.

Lakhone is an important center on the right bank located opposite Tha-Khèk, which is the nearest point to the Annam coast on the whole Mékong (1). [361]

(1) From Tha-Khèk to the mouth of the Cua-Nhuong (Hatinh) is reckoned 180 kilometers as the crow flies.

Just below the 17th parallel is found Muong-Panom, the holy city [87] [Illustration] [88] [Blank page] [89] of Laos and a celebrated spot of pilgrimage, by reason a That (1) which is said to contain relics [178]

(1) A that is a kind of stele or four-sided pyramid.

of Buddha. Opposite Panom, on the left bank, the Sé-Bang-Fai flows into the Mékong.

The Sé-Bang-Fai comes from the Annamitic Chain. It has a sinuous and extremely long course, but cannot be navigated in any season except by pirogues as far as Pou-Houa, that is to say for a distance of about eighty kilometers.

Below its mouth, and thirty kilometers upstream from Savannakhèt, is the Keng-Kabao. The latter deserves mention here, for during the low water period it forms an insurmountable obstacle for steam launches, which never go below this point from November to July.

Difficulties in navigation do not begin until after Hueûn-Hin, and the steam launches of the River Merchant Fleet Company [compagnie des Messageries fluviales] could reach that point during the high water period if there were any commercial advantage to be gained by so doing.

A series of rapids stretches over a length of about 160 kilometers between Hueûn-Hin and Pak-Moun. These are known as the "rapids of Kemmarat" because of the large muong (2) on the right bank which

(2) Muong = province; also means capital of a province. [631]

is located along this part of the river. They are a succession of rapids

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arranged in tiers, which the Mékong descends at speeds which have been found to be as high as eight or nine miles per hour during the high water period. The extremely violent current encounters many rocks and forms whirlpools and eddies which are extremely dangerous to navigation. The pilots and pirogue boatmen must have a great deal of composure and skill in order to direct their great rafts along the upper river through the lashing waves and to prevent them from foundering on the reefs towards which the rapidity of this enormous mass of water impels them.

Francis Garnier speaks as follows of these rapids:

"During the low water period the river here has the appearance of an immense dried-out torrent which has left vast banks of sandstone bare all along its course. An irregular channel [90] winds through the middle of its rocky bed. It is sometimes less than sixty meters wide, while its depth sometimes exceeds a hundred meters at a few points where the current is slow-moving. Each narrowing of the channel produces a rapids or Keng. The latter are the only hazards in this difficult kind of navigation, and each of them has been given a special name by the natives" (1).

(1) Francis Garnier, op. cit. [Voyage d'exploration en Indo-Chine, 1885.]

The rapids which are the most difficult to negotiate and where the greatest number of pirogue accidents occur are, going downriver, the Keng-Mouang and the Keng-Sa above Kemmarat, and below it the Keng-Ngao-Fa-Khop, the Keng-Ka-Niên, the Keng-Kong-Louong (at about 15° 41' N. latitude), the Keng-Nam-Phong, the Keng-Ya-Peut and the Keng-Tha-Kiên. During the high water period the steam launches from the following reach could, if the need should arise, go up as far as Tha-Kiên just below the rapids. This point is of some importance, for it is there that the most direct road between Oubône and Kham-Thong-Niaï and Saravane intersects the river, and Tha-Kiên is less than twenty kilometers from Kham-Thong, that is to say from the Sédone.

Before Pak-Moun the direction of the Mékong, which ever since the mouth of the Nam-Ka-Dinh had been approximately north-northwest and south-southeast, suddenly changes and a spur of Pou-Kang-Huon forces it to curve sharply to the west for a few kilometers,

as far as the mouth of the Moun.

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In this region of rapids the Mékong has only one major tributary, the Sé-Bang-Hièn, which flows into the river opposite Kemmarat.

The Sé-Bang-Hièn (about 250 kilometers in length) derives its importance from the fact that its course and that of its tributary the Sé-Tchépon open a road from Annam to Laos in the middle reach. The Sé-Tchépon is, in fact, navigable from Lao-Bao (Aï-Lao) on during the high water period. Since the latter point is only about 50 kilometers from Maï-Lan, where the river of Quang-Tri is also navigable, it will readily be understood that in 1893, or even 1894, when it was essential at all cost and as quickly as possible to reach the great reach of [91] Vien-Tiane and there fly the French flag on a steam launch, someone should have thought of taking a demountable launch from the Annam coast to the middle basin of the Mékong by way of the depression of Aï-Lao. The plan could not be attempted, until the high water period of 1895.

M. Mercié, a ship's ensign, succeeded in crossing the Aï-Lao gap at an altitude of no less than 410 meters, with his launch taken apart and carried by bearers. When put together and set afloat again on the Tchépon the Fourmi was able to reach the Sé-Bang-Hièn and to negotiate four of its rapids. But it struck bottom in the fifth one, the Pak-Sé-Metch, and was broken up by the rocks just at the moment when it was about to enter the lower Sé-Bang-Hièn, that is to say in a part of its course where the river had only a few unimportant shelves which are covered, in the right season, by more than ten meters of water.

Even supposing that the attempt could have succeeded, the useful and practical advantage to be gained from the venture at the time is not too clear, since the Massie and the La Grandière had already passed the Kemmarat rapids and were in the reach of Vien-Tiane (1),

(1) The La Grandière had even reached Luang-Prabang on September 1, 1895.

which was the first goal to be attained. Moreover, because of the launch's light tonnage and low engine power, even if ship's ensign Mercié's undertaking had succeeded it would not have proved beyond all question of a doubt that the Sé-Bang-Hièn and the Sé-Tchépon were commercially navigable for launches of a practical tonnage.

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Finally, at the junction of the Sé-Bang-Hiên with the great river the Fourmi would have found itself confronted by other and almost insurmountable obstacles before it could gain the navigable reach, such as the Keng-Sa and the Keng-Mouang. We must nevertheless pay homage to the real efforts which were accomplished in a completely disinterested undertaking by this young and daring naval officer.

The following are the average lengths of journeys by river from Vien-Tiane to the nearby posts on this reach:

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[92]

JOURNEY		High Water Season		Low Water Season	
		Upriver	Downriver	Upriver	Downriver
		Number of days by pirogue	Number of days by pirogue	Number of days by pirogue	Number of days by pirogue
Mekong	Vien-Tiane to Pak-Lay	8	4	13	7
	Vien-Tiane to Pak-Hin-Boun	1 (steam launch)	1 (steam launch)	2 (steam launch and pirogue)	2 (steam launch and pirogue)
	Pak-Hin-Boun to Savannakhet	1 (steam launch)	1 (steam launch)	2 (steam launch and pirogue)	2 (steam launch and pirogue)
Nam-Hin-Boun	Pak-Hin-Boun to Keng-Kiet	3	2	3	2
Nam-Sane	Pak-Sane to Tha-Tom	6	3	6	3

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3. The Inner Reach

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After being joined by the Moun, the largest tributary on its right bank, the Mékong turns back eastward. As it leaves the narrow gorge of Pak-Moun where its course narrows to as little as 200 meters in width between sheer cliffs, it resumes a general north-northwest and south-southeast direction and spreads out over rich plains as far as the mouth of the Sédone.

Korat (1), the largest market in Siamese Laos, also belongs to the

(1) The Moun passes about 25 kilometers to the southeast of Korat.

Mékong basin through the Ta-Krong. The importance of this center is well-known, and today it is directly connected with Bangkok by a railway. Oubône (2), the other market town which is the storehouse

(2) Korat and Oubône are the seats of two French consulates.

of Lower Laos for Korat and Bangkok, as Nong-Khay is the storehouse of Upper Laos, is situated on the banks of the Moun about 300 kilometers from Korat, and only sixty from the Mékong. Communication between Korat and Oubône is achieved mainly by land, by means of ox-carts. We have seen in the foregoing that [93] steam navigation had been attempted on the Moun during the high water period as early as 1891, and that the Siamese were then planning to send their steamships out on the Mékong in the hope of getting there ahead of us. The launches provide a highly irregular service between Oubône and Tha-Phan-Sang, which is about 25 kilometers downstream from Korat. The trip takes from eight to ten days going upriver, and four to five coming down.

[492]

In its lower course, that is to say between Oubône and Pak-Moun, the Moun is barred near its mouth by shelves which make navigation extremely difficult, even for pirogues, during part of the year. The Chinese merchants of Oubône, however, who go by pirogue to Bassac or out on the Sédone, go up and down the Moun in all seasons. Because of the particular service for which they are used, their pirogues are known by the special name of Hua-Moun, or pirogues of the Moun (1)

(1) See table, Chapter VIII.

of the Moun (1). 000

(1) See table, Chapter VIII.

The most difficult rapid to negotiate is the Keng-Tanah, situated only three kilometers from Pak-Moun. During the low water period it is necessary to unload them completely and transport them by hand across dry land over extremely rough sandstone rocks. It has been negotiated during the high water period by the single-wheeler the Haiphong, and since the current beyond the rapids is weak and the width sufficient (300 meters), steam navigation is possible as far as Oubône for perhaps two or three months. 505 133

Francis Garnier describes this region as follows (2):

(2) Francis Garnier, op. cit. [Voyage d'exploration en Indo-Chine, 1885.]

"From Pi-Moun on the river is once more unobstructed. A very weak current, straight banks and a uniform width give it, in certain spots, the appearance of a canal dug by man."

At Pak-Sédone the Mékong is joined on its left bank by another important tributary, the Sédone. This river, which is about 200 kilometers in length, rounds the northern part of the plateau of the Bolovens. All the roads which descend from this mountain mass end in its valley, and all the products of the region leave it by way of the Sédone. Cardamom, which is the most important of these, is [94] an item much dealt in at the temporary market of Champi. The latter is the terminus of the convoys which come down from the plateau, and from this point on merchandise goes by river to Bassac or Oubône. 438 361 241

The market of Champi had to be established fairly near the mouth of the Sédone, for just upriver and less than thirty kilometers from Pak-Sédone the river is barred by insurmountable waterfalls [Illustration here] fifteen meters in height. From the point of view of navigation the Sédone is therefore divided into two sections: the part situated above the falls and the part situated below. 505 133

To the north of the falls the Sédone has a reach some thirty kilometers in length which can be navigated in all seasons by pirogues

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as far as Muong-Khong (1), the point where the roads from Ban-Mouang

(1) During the high water period the Sédone can even be navigated as far as Smia by light pirogues.

to Saravane and from Ban-Mouang to Song-Khone fork. Some pirogues go directly from Kham-Thong-Niaï to Bassac, and in this case [95] the cargo is completely unloaded above the falls and the pirogues are carried overland across steep rocky slopes.

Below the falls the river is accessible to steam launches during the high water period. Before the establishment of steamship service by the Cochinchina River Merchant Fleet Company [compagnie des Messageries fluviales de Cochinchine], the single-wheeler Haïphong provided a regular weekly service for dispatches, travelers and merchandise as far as Champi and Keng-Kok. This lower part of the river's course can be navigated by pirogues in all seasons, but during the low water period the many shelves make navigation extremely difficult.

From the Sédone on, and as far as Bassac, the Mékong is hemmed in by the mountains of Bassac which tower steeply over its right bank and reduce its width to about 500 meters. Francis Garnier characterizes as follows the difference between this gorge and the broad plains which border the river downstream from Bassac (1):

(1) Francis Garnier, op. cit. [Voyage d'exploration en Indo-Chine, 1885.]

"The character of the landscape changes in sudden fashion. Instead of the smiling, uniform plains which the sparkling waters slowly traversed and where they formed hundreds of islands, and instead of the almost submerged banks hidden by long lines of palm trees and houses, there are sheer banks where rocks crop up everywhere and high undulations covered with forests which hem in the rapid black water on all sides."

The river valley then widens out again, and at Bassac itself reaches a width of nearly two kilometers. Bassac is a point of transit where the produce of the region comes to be taken on either for Pnom-Penh or for Oubône. Opposite this center is the large, well-cultivated island of Don-Dèng. From Bassac to Khong, that is to say over a distance of about 100 kilometers, the Mékong flows

in an almost exactly north and south direction through rich and extremely fertile plains where villages succeed one another almost without interruption. Halfway between Bassac and Khong there is another large island, called Don-Saï, which like Don-Dèng is highly populated and well-cultivated. Upstream from the island of Khong the river becomes much wider (eight to ten kilometers) and contains an important [96] group of islands which, by reason of their number, are known as Si-Pan-Don (4000 islands). The island of Khong is by far the most important. It is twenty kilometers long, seven wide, contains several fine villages and has a total population of 10,000 (1).

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[361]

(1) In all Laos, this is the point where the population density is greatest with respect to the area (1500 inhabitants per 100 square kilometers).

[161]

On this island is located the city of Khong, the former capital of Lower Laos. [Illustration here]

[361]

Slightly below the 14th parallel is found the island of Khône, famed for its waterfalls which form an absolute obstacle to navigation. Francis Garnier has given us a detailed description of the falls, which he calls cataracts. A few lines of his description are given below (2):

(2) Francis Garnier, op. cit. [Voyage d'exploration en Indo-Chine, 1885.]

"The two largest channels and the most beautiful cataracts are found on the outermost arms of the river, the Salaphe branch and the Paphèng branch. There one may see waterfalls more than fifteen meters in vertical height and which [97] sometimes reach a width of one kilometer. The broken line of cataracts has a total extent of twelve or thirteen kilometers. Upstream the river narrows momentarily until it occupies not more than half this extent, then it spreads out again over the immense plateau of rocks which precedes the falls, losing itself in the midst of numberless islands and embracing between its two banks a space of nearly five leagues."

We have already seen that a railway was established from north to south across the island of Khône to serve as a link between the reaches of Kratié and Bassac. [Illustration here]

The reach of Bassac can be navigated by steam launches during

505 the high water period from North Khône to Pak-Moun, that is to say
133 over a distance of nearly 200 kilometers. When the waters fall the navigable extent is reduced, and at low water only a limited service of about thirty kilometers is possible, from Ban-Dong to the southern point of Don-Sal. All the rest of the journey must be made by pirogue, for these small boats can circulate quite easily in this reach in all seasons. Rafts are used only going downriver.

The average length of journeys by river on this reach between Bassac and nearby points is as follows:

	JOURNEY	High Water Season: Upriver — Number of days by pirogue	High Water Season: Downriver — Number of days by pirogue	Low Water Season: Upriver — Number of days by pirogue	Low Water Season: Downriver — Number of days by pirogue
Mékong	Bassac to Pak-Sédone	2-3 hours (steam launch)	1-1.5 hours (steam launch)	1	1/2
Mékong	Pak-Sédone to Savannakhèt	20	5	16 to 18	6 to 8
Mékong	Bassac to Khône	1 (steam launch)	1/2 (steam launch)	3 (steam launch and pirogue)	3 (steam launch and pirogue)
Sédone	Pak-Sédone to Kham-Thong-Niaï	3	2	3	2
Sédone	Kham-Thong-Niaï to Smia	2	1	2	1

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4. The Maritime Reach

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Below Khône the Mékong is encumbered by islands, islets and shelves which are more or less difficult to negotiate. During the high water period the river covers most of these hazards. Only the crests of the trees are left above water, and one navigates in a veritable submerged forest which reminds one of an inundation.

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Stung-Treng is an important center, especially by reason of its site, for the city is located at the junction of the Mékong and the Sé-Khong, somewhat below the point where the latter joins the Sésane, which is itself swelled near its mouth by the Ton-Lé-Srépok. The produce of the region of Attopeu naturally finds its way to Stung-Treng, for it is the commercial intermediary between this region and Cambodia.

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At Thboung-Kla, thirty kilometers below Stung-Treng, the Mékong enters Cambodian territory. Then begins a long series of rapids which impede its course and make it difficult [99] [Illustration] [100] [Blank page] [101] negotiate, but which do not constitute an insurmountable obstacle for steam launches which have sufficient speed. The first important post in Cambodia is at Kratié, and steamships can go up as far as this point in all seasons.

The Sékhong, the Sésane and the Srépok form a basin which is noteworthy for its extent, being equal in area to all of Cochinchina. Unfortunately, the population density and importance of trade in the basin are not in proportion to so considerable an area. The valleys are sparsely populated and traffic there is, in consequence, quite limited. Finally, these watercourses are difficult to negotiate.

The Sékhong is a river whose course stretches over about 400 kilometers. Its sources lie near the 16th parallel, some hundred kilometers to the southwest of Hué, in the orographic nucleus of the Annamitic Chain which also gives rise to one of its large tributaries, the Dak-Poyo.

The upper course of the Sékhong bears the name of Dak-Mout. This river crosses an extremely rough region where towering rocks hem in its torrential bed. Beyond Koum-Kang the valley of the Sékhong widens out and small pirogues can navigate there.

At Muong-Mai, that is to say somewhat below the 15th parallel, the Sékhong is joined by the Sé-Kémane, an important tributary which, under the name of the Dak-Poyo, has its origin in the same mountain mass as the Dak-Mout. After it, like the Sékhong, flows past steep

149: Reinach--76 G-3 (no date) 1901 AM1 Indochina
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rocks which tower precipitously over its course, the Sé-Kémane widens out as it is joined by the Dak-Bla, the sources of which, like those of its chief tributary the Sé-Souk, are near the Sésane. The Sé-Kémane is hardly navigable for pirogues except from Muong-Kao on. The latter is the most important center in the region and is generally known by the name of Attopeu. Pirogues can ply back and forth between this point and Stung-Treng in all seasons, but the many rapids with which the Sékhong is encumbered, mainly as far as the Sé-Pien, make its course extremely torrential and navigation very difficult. Before it reaches Siempang the Sékhong is joined on its right bank by the Sé-Pien which, like its [102] tributary the Sé-Kampho, comes from the plateau of the Bolovens. When they leave their gorges these two rivers water marvelous plains which are slightly hilly towards the north and which could serve as pasture land for immense flocks. From Siempang on the Sékhong can be navigated by steam launches during the high water period.

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Before it reaches the Mékong the Sékhong is joined, less than ten kilometers from its mouth, by its chief tributary the Sésane, which with its 400-kilometer course is of no less importance and interest than the Sékhong itself.

The Sésane comes from a mountain mass which dominates the amphitheater of Cong-Bol just above the 15th parallel. Its deep valley is called Poco by the natives. Like all the upper valleys of the watercourses in this region, it is encumbered with rapids and waterfalls and deeply cut between rock walls. On its left bank the Poco is joined by the Bla, the valley of which is followed for some distance by the road joining Attopeu to Qui-Nhon by way of Kon-Toum. The Sésane then traverses all this gold-bearing region which is still little-known and, so to speak, unexploited to this day. In its valley are found the mining posts of Ban-Phi, Ruhleville and Bokham. It can be navigated by pirogue in all seasons from Kong-Sédam on. The latter point, slightly above Ban-Phi, has a militia post stationed there to provide security for the works of the Attopeu Gold Mining Company [compagnie des Mines d'or d'Attopeu].

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Some twenty-five kilometers from its mouth the Sésane is joined by the Ton-Lé-Srépok, a large tributary. This river, also known as the Sé-Bang-Khan, comes from the south, not far from the plateau of Lang-Bian. It passes close by Darlac, the capital of the province of the same name, and through Ban-Don, from which point it is

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navigable during part of the year.

The Ia-Drang, whose valley is inhabited by the Djarai tribe, is one of its principal tributaries. For that matter, the most important Kha tribes are settled in the valleys of the watercourses which have been dealt with in the foregoing. Thus we find the Lovè Khas between the Sé-Khong, the Sé-Souk and the Sésane; the Niaheun Khas and a few Alaks in the valley of the Sékhong; the Souk Khas in those of the Sé-Pien, [103] [Illustration] [104] [Blank page] [105] the Sé-Kampho and the lower Sékhong; the Salangs between the Sésane and the Sé-Souk; the Bahnars and the Rognaos in those of the Bla and the other left-bank tributaries of the Poco; the Penongs in the deep valley of the Srépok; the Djarais in the middle valley of the Sésane and in that of the Ia-Drang; and the Braos and the Tiam-Poueun in the lower Sésane. Those [Illustration here] of the Kha tribes which have been pacified work the gold-bearing alluvia of these rivers and pay their taxes with the gold dust which they extract.

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Upriver from Stung-Treng and as far as the waterfalls the Mékong can be navigated at low water by steam launches. At high water the large steamers of the Cochinchina River Merchant Fleet [Messageries fluviales de Cochinchine] which provide service between Saigon and Pnom-Penh can go up as far as Khône. Below Stung-Treng and as far as Kratié the river can be navigated only by pirogues at low water. The following table [106] shows the average length of journeys by river between Stung-Treng and nearby points on this reach:

JOURNEYS		High Water Season		Low Water Season	
		Upriver	Downriver	Upriver	Downriver
		Number of days by pirogue	Number of days by pirogue	Number of days by pirogue	Number of days by pirogue
Mékong	Stung-Treng to Khône	3 hrs. (steam launch)	1.5 hrs. (steam launch)	1/2 hr. (steam launch and pirogue)	1/2 hr. (steam launch and pirogue)
Mékong	Stung-Treng to Kratié	6 hrs. (steam launch)	3 hrs. (steam launch)	3	2
Sékhong	Stung-Treng to Attopeu	18	4	12	6
Sésane	Stung-Treng to Ban-Phi	12	4	15	6
Srépok	Stung-Treng to Ban-Don	18 to 20	8	--	--

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[114] of what has been observed, and because no better expression of the facts could be hoped for.

THE THAI RACE

142 "Laotians. Of all the Thais, the Laotian is the one who has
144 remained the purest, although he has a much higher proportion of Aryan blood than the other varieties, with the exception of the Lus. Fairly tall in stature, his hair cut short, elegant in his movements and more refined than all the other inhabitants of the land, he is the aristocratic type of Laos. His upbringing, his education, his religion and even his vices have a mark of distinction which make
438 them stand out above those of his neighbors. An excellent boatman, and a trader rather than a farmer, he is the one who seems the master
• 505 of the land, as much by virtue of his commercial aptitudes as by the
484 ease with which he ranges the country. Mounted on his long and narrow shaped pirogue, made in one piece of a tree trunk hollowed out by fire, he goes great distances to visit peoples of the most varied races [175] [Illustration] [176] [Blank page] [177] and serves as a link between all the human varieties which populate Laos. He is at home and at his ease everywhere, standing out clearly above all his countrymen in this respect.

[361] "The Laotian prefers to settle along navigable watercourses and in proximity to plains of ricefields. He is glad to have his land
[241] worked by mercenaries or by dependents of inferior race, and some-
[567] times by slaves (at least before our arrival). He himself, with quite an extensive knowledge of the needs and resources of the other inhabitants of the land, particularly likes to traffic in all kinds of merchandise. He it is who goes to buy forest products and cereal grains on the spot from the mountainfolk or from sedentary farmers, and sells them cloth, salt, tobacco, earthenware, farming implemen
[439] etc. in exchange. He it is who exports the products of Laos to neighboring countries and brings back the things which Laotian industry cannot produce. His business as a commercial traveler, which he likes and which gives him a good standard of living, occupies him for only a few months of the year but brings him into contact with all the neighboring peoples and also with the Europeans and Chinese in the Siamese, Annamite and Cochinchinese trading posts. Thence arises his veneer of civilization which strikes one at first glance.

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435 The following table shows the considerable discrepancy between purchase prices within the country and sale prices on transit and European markets.

In the last seven years Laos has become a French possession, but [505] the interior conditions of trade and exchange have not varied. A single modification has been the fruit of our occupation, the creation of a line of steam transport on the Mekong. This service, although still not perfect, nonetheless constitutes [427] [Illustration] [428] [Blank page] [429] the most economical route from Luang-Prabang or Nong-Khay to Cambodia and the sea. Unfortunately, the customs barrier is there to stop the products which our industries do not yet manufacture but which our merchants could import into Laos in competition against those brought in through Siam, Burma and Yunnan.

Markets	Sticklac per 100 kilograms	Benzoin per 100 kilograms	Cardamom per 100 kilograms	Rubber per 100 kilograms
	francs	francs	francs	francs
Hua-Pahn (Laos)				1st quality 166 to 208 2nd quality 85 to 115
Nong-Khay, Vien-Tiane (Laos)	50 to 60	150 to 250	55 to 60	1st quality 250 to 280
Bassac (Laos)	38 to 40		92 to 100	
Pnom-Penh and Cholen (Cambodia & Cochinchina)	54 to 70		133 to 165	1st quality 540 to 625
Korat (Siam)	75 to 95	250 to 280	85 to 110	
Bangkok (Siam)	125 to 135	300 to 350	140 to 180	
London (England)	220 to x	500 to 700	250 to 310	1st quality 750 to 835
Hamburg (Germany)				1st quality ~800 to 1000 2nd quality 450 to 600

439 178 [437] The conclusion to be drawn from the preceding tables is not favorable toward orienting Laotian trade towards the ports of French Indo-China. It is evident that the export trend of animals and products shows a marked tendency to move towards Oubone and Siam. Indeed, Siam's share of total exports from Lower Laos (merchandise and animals), which was 179,627 francs in 1898, rose to 381,185 francs in 1899. This was an increase of more than double.

On the other hand, we see that the share of Annam, Cochinchina, and Cambodia in this same traffic, which was 699,712 francs in 1898, fell to 466,477 francs in 1899, representing an approximate decrease of one-third.

[196] The causes of this persistent and increasing orientation of Laotian trade towards Siam are perhaps to be sought in the opening of the railroad from Bangkok to Korat (1) as well as in the customs system of

(1) The king of Siam inaugurated this line on December 21, 1900.

French Indo-China.

439 497 505 There is no question but that the railroad constitutes a considerable improvement over the old means of transport, as much by virtue of the lower costs and shorter travel time as by the suppression of the dangers and bothers of the cart road from Korat to Bangkok (domestic duties, exactions of the local authorities, robberies, etc.). But are these reasons sufficient to explain or justify the admitted fact?

The River Merchant Fleet [Messageries fluviales] service is, as we have previously noted, the most rapid and least expensive means of transporting merchandise from Luang-Prabang to Saigon. Why then is this service, which is superior even in its present imperfection, scorned by exporters in general and used mainly by importers for products destined for the Europeans in Laos? The answer is a simple one. Exporters would not hesitate to use the Mekong route and to transport their products to Pnom-Penh or to Saigon-Cholon if, as they can do at Moulmein, at Xieng-Mai, at Nong-Khay, at Bassac, at Oubone, at Korat and at Bangkok, they could obtain [438] supplies there of imported merchandise from various sources to make up the counterpart of their exports. But, besides the fact that they would not be able to find certain special merchandise which is indispensable to them in the French marketplaces, they could not obtain the rest except at an increase of fifty or sixty percent or even more over the ordinary prices in the markets of Siam and Burma which we have just cited.

492 and some are even trained to trot. It may be reckoned that the average distance covered daily by a team of two oxen, on flat ground, naturally, is from 15 to 20 kilometers.

501 505 2. BY WATER. Besides the natural method of floating, or of floating improved by bamboo air jackets (used for rough timber), steamships, pirogues and rafts are used in Laos for trips and for transport.

Steamships. The steamships in Laos at present are:

1. The Lagrandière, a 100 metric ton gunboat which is at present immobilized at Xieng-Kok, just above Xieng-Lap.

2. The fleet of the superior residency, including the Argus, the Haiphong and the Ham-Luong.

3. The commercial fleet of the Cochinchina River Merchant Fleet Company [Compagnie des Messageries fluviales de Cochinchine], composed of the following ships: the Trentinian, the Colombert, the Garcerie and the Vien-Tiane, each of 105 tons' burthen, and the Massie of 100 tons (1).

(1) See Appendix XXX.

Pirogues. Pirogues are used for trips and for transporting merchandise, particularly in an upriver direction.

There are pirogues on the Mekong and its chief tributaries which are capable of covering great distances and which vary in size and in tonnage. They are from 10 to 25 meters long and can transport from 1 to 6 tons of merchandise. Depending on their size and the difficulty of the journey, these pirogues are manned by a sufficient number of men, generally varying from four to ten. [445] They are maneuvered by oars and poles going downstream, and by poles and towlines going upstream.

Rafts. There are two kinds of rafts. Some are formed of two pirogues which are joined side by side, covered with a floor and lightened on the sides by packets of bamboo, while the others are composed solely of bundles of bamboo which are solidly joined and then covered with a floor. Both kinds are used going downstream only. The former are dismounted when the journey is over. [Illustration here] The pieces of bamboo are removed, and the disjoined pirogues are ready to go back upstream separately.

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The rafts which are composed solely of bamboo are demolished upon their arrival, and the material which went into them is sold for various uses, particularly for making tiles of crushed bamboo.

Depending on their dimensions the rafts made up of two pirogues will have a crew of six to twelve men, who also serve as pirogue boatmen on the return trip.

The bamboo rafts have a similar crew, although their progress is necessarily much slower than that of the above rafts.

The following is a list of the various kinds of pirogues and rafts used in Laos:

149: Reinach--365a G-3 (no date) 1901 AM1 Indochina
Laotians AM8

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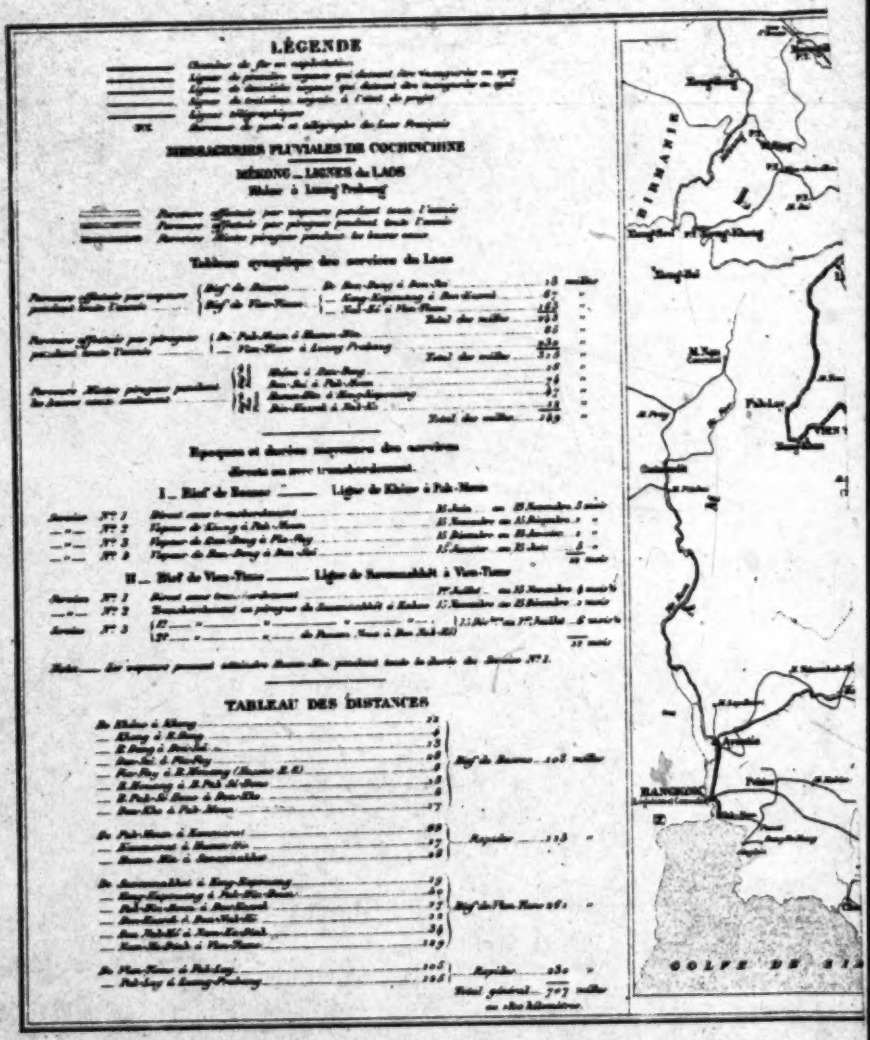

Map of means of communication by river, by postal and telegraph service and by railway in 1900.

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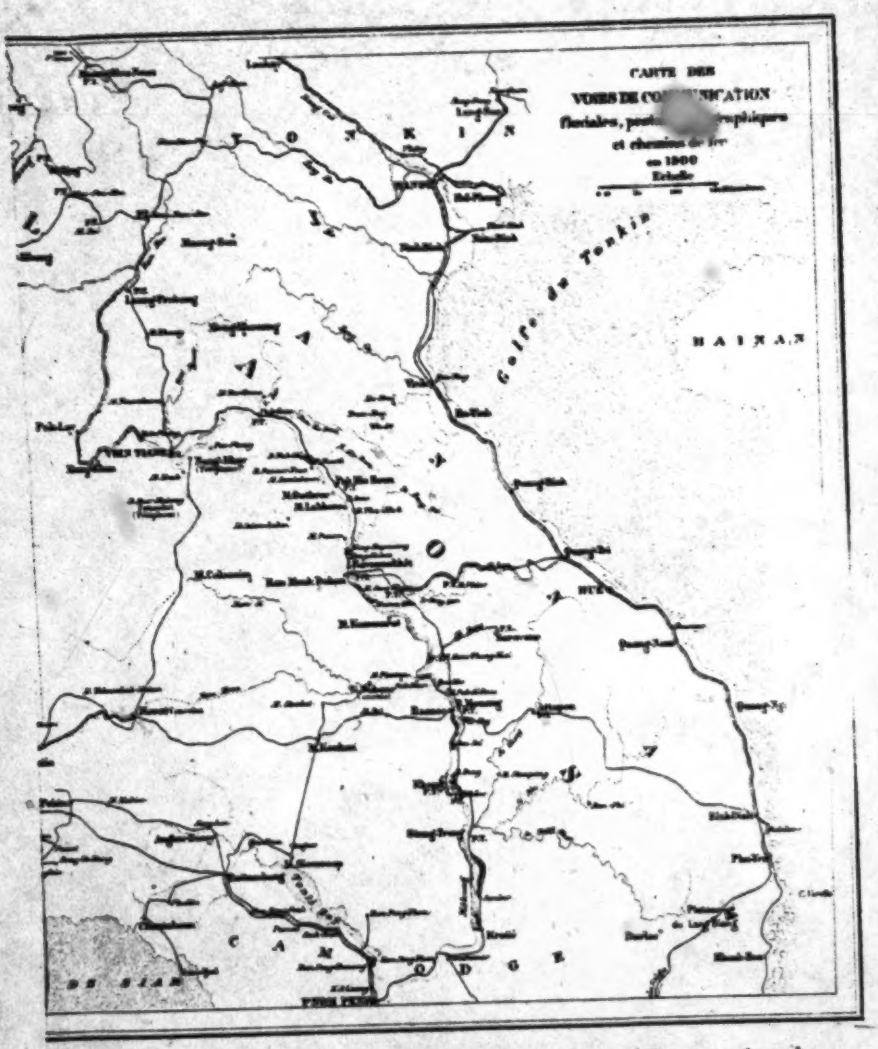

Map of means of communication by river, by postal and telegraph service and by railway in 1900.

Plate 6, Part B /between pp. 480-1/

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[113]

which the difficulty of communications is now impeding."
(Bulletin économique de l'Indo-Chine, loc. cit.)
[Translator's note. Probably refers to December 1900 issue, "Rapport du Résident supérieur sur le Tran-Ninh."]

5. POSTAL AND TELEGRAPH SERVICE

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The telegraph network in Laos is quite complete. At the present time only three commissionerships are not served by a telegraph line, those of Tran-Ninh, the Hua-Pahn and Darlac. All the other provinces possess one or several telegraph offices, where postal service is also provided.

Examination of Plate VI will show the extent of the telegraph network in Laos. The lines are divided into two sections: the northern one which is under the jurisdiction of the Annam-Tonkin central office, and the southern one which is attached to the Cochinchina-Cambodia central office. [484] The two sections are not connected with one another, but soon will be. Tonkin will then be in communication with Cochinchina by means of a line which will cross all of Laos from north to south.

When this result has been achieved, that is to say when the Luang-Prabang-Vien-Tiane section has been completed, the Laotian network will be 2,283 kilometers long: 1,168 in Upper Laos and 1,115 in Lower Laos.

[505] By the terms of a contract between the administration and the Cochinchina River Merchant Fleet Company [Compagnie des Messageries Fluviales], the latter was made responsible for the transport of postal dispatches on the Mekong as far as Luang-Prabang (1). Outside

(1) This company receives an annual subsidy of 300,000 francs from the government of Indo-China for this purpose.

of the region of the river, and even in certain stretches served by the Company where service can be made more rapid, the administration has recourse either to human carriers or to pirogues.

6. SERVICE BY THE RIVER MERCHANT FLEET [MESSAGERIES FLUVIALES]

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Transport for merchandise and passengers is provided on the Mekong as far as Luang-Prabang by the Cochinchina River Merchant

• 505 Fleet Company [Compagnie des Messageries fluviales de Cochinchine].

Although the organization of this service is not perfect, it cannot be denied that the company has made an outstanding contribution to the development and prosperity of Laos, where its ships travel more than 20,000 marine leagues annually. M. Lagrillière-Beauclerc, in his interesting book A travers l'Indo-Chine (2), has given an

[113] (2) Lagrillière-Beauclerc, A travers l'Indo-Chine, Paris, 1900.

excellent report, as follows, of the results obtained:

"To return to the considerable development of production occasioned by the establishment of the first regular service on the great river in the direction of Kratie and Laos, and to the business activity which has been the consequence thereof, it will suffice to say that the regular subsidized service, which was only weekly in the beginning and provided by an ordinary launch, is now provided twice weekly by [485] means of two rapid ships (1) and has competition in the form

(1) The Bassac and the Vien-Tiane.

of a large number of steam launches belonging to Chinese for the most part. These launches take on merchandise every day and transport hundreds of native passengers, Malays and Chinese, both upstream and downstram between Pnom-Penh and Kratie. Both banks of the river, where villages used to be widely scattered, are today populated and cultivated almost continuously.

"We should note, however, that so far these latter launches [Illustration here] have not gone upriver beyond Kratie. The first rapids of the river have frightened their owners, who leave it to the vessels of the River Merchant Fleet [Messageries fluviales] to provide postal and commercial communication with Laos.

"This service, which was begun in 1891 and which has the Bassac, a special steamship with a shallow draft and high speed, can only be provided during the high water period. It connects with that which the River Merchant Fleet organized in 1896 on the Mekong beyond Khone, serving Lower and Upper Laos as far as Luang-Prabang, and whose economic results are beginning to be felt. Indeed, an appreciable movement of exports to Cambodia and Cochinchina [486] is taking shape more and more in the Mekong valley. Even as early as 1897 and 1898, the vessels were scarcely sufficient to the need during the high water period. Large quantities of nep (rice suitable

505 Large quantities of nep (rice suitable
438 for making alcohol), hides, horn, cardamom, wax, benzoin, various gums, etc. were shipped from Bassac, from Pakse, from Savannakhet, from Vien-Tiane and from other Laotian centers which had formerly traded exclusively with Bangkok by way of the Nongkay-Outaradit route on the Menam and by the Korat route on the Se-Moun.

505 "Passenger traffic, which was almost nil when the new services
484 were established, is increasing every day. The natives are beginning to become familiar with this rapid, convenient and inexpensive manner of traveling which the steamship represents and they are making more frequent use thereof, a fact which can only contribute to the broadening of relations between the various posts scattered along the great river and increase trade in their products of all kinds" (1).

(1) See, in Appendix XXX, the transport rates between France and Indo-China and between Saigon and Laos.

[487] [Illustration at top of page]

CHAPTER XI
1. SOCIAL STATUS. SLAVERY

[565] Upon our arrival in Laos, we found a hierarchial society com-
567 prised of nobles, commoners and slaves. We could not do better than to preserve all features of the political, social and administrative
178 organization just as it had been. In this respect we took our inspiration from our predecessors the Siamese, leaving our new subjects the
177 utmost liberty and respecting their traditions, customs and mores insofar as these were compatible with our own institutions.

Thus we were at times forced to recall certain native officials who had compromised themselves with the Siamese, or who through their exactions had made themselves unworthy of their office. Moreover, we have always acted tactfully and mildly, [488] leaving the choice of officials to election, in accordance with custom.

But above all, we took radical measures by completely suppressing the slave trade and by regularizing a very mild form of slavery for debt.

[556] There used to be slavery in Laos, as in Siam, in the form of slavery by capture, by purchase and for debt. It yielded high profits for those who engaged in the traffic, for the children and grandchildren of slaves were slaves themselves at birth, a fact which increased the fortunes of their masters to that extent.

314 which range from the size of a nut to the size of a billiard ball. These specimens are not sticky, do not deteriorate very much and are far superior to the preceding ones. I believe that it was a specimen of this last category which M. de Reinach, the government commissioner in Laos, sent to Paris, where it was valued at 7 francs per kilogram.

Since this specimen was sent we have sent two others for trial and evaluation to the business house Michelin et Cie., a large rubber manufacturer in Clermont-Ferrand.

The Superior Resident in Laos informs us that the Khua-nhut-niai, the liana which produces rubber, is found in all the thick forests along the banks of the Mekong. It grows in great numbers in the forests of the Bolovenes massif and on the sides of the great chain in the provinces of Saravane, Song-Khone and Cam-Muon. M. Tournier estimates that it can reproduce easily, [134] either by seeds or by cuttings. He believes it would also be easy to induce the natives in these regions to engage in the regular exploitation of the plant whenever they found a certain and remunerative market for the product.

To sum up the above observations, we have noted that Indo-China possesses at least two plant varieties which can yield rubber of excellent quality. These two varieties are the Parameria glandulifera in Cochinchina and the south of Cambodia, and an as yet undetermined species of Apocynaceae in Annam and Laos. Both the one and the other grow in such numbers that they hold forth hope of a veritable source of wealth for the colony. Up to the present time, only the lianas of the second variety have been exploited, and I should like to call attention to those of the first variety.

439 The customs statistics for exports from Tonkin for the whole of 1898 show that France received from this country 1,545 kilograms
314 of crude rubber with a value estimated at 2,020 francs, and that other countries received 619 kilograms with a value estimated at 947 francs, making a total of 2,164 kilograms with a value of 2,967 francs (1).

[505] (1) It should be noted that the greater part of this product leaves Vinh, in Annam, by coastal vessels, and that Hai-Phong is given as the port of embarcation on the Tonkin export lists.

For the first quarter alone of the current year, we find the following exports from Tonkin: to France, 13,623 kilograms with a value